

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Original) An apparatus for the controlled automated performance of polymerase chain reactions in at least one sample tube containing a known volume of a liquid sample mixture, which apparatus comprises:

- a. a sample block having at least one well for said at least one sample tube,
- b. a computing apparatus,
- c. heating and cooling means controlled by said computing apparatus for changing the temperature of said sample block, and
- d. means for determining the temperature of said block in a first sample interval, wherein said first sample interval is an interval of time designated as time n ;

wherein said computing apparatus includes means for determining the temperature of said liquid sample mixture as a function of the temperature of said sample block over time.

2.-218. (Cancelled)